APRIL 1957

FIREMEN

SIXTY-FIRST YEAR • NATIONAL FIRE PROTECTION ASSOCIATION

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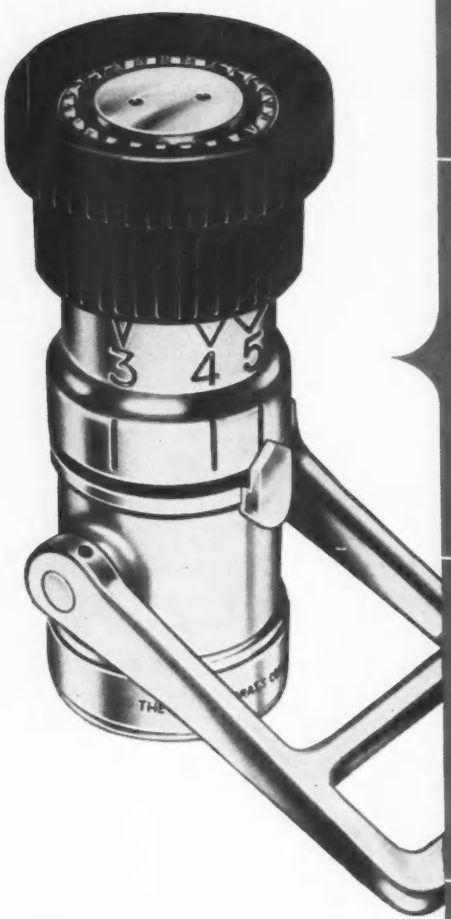

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An Imperative Need

Lower Merion had every reason to be grateful to Philadelphia for its assistance at the Autocar fire last week . . . and ultimately it may be grateful for more than the immediate aid given during the fire. The whole Main Line may eventually owe the Philadelphia fire department a permanent debt of gratitude for introducing it to the "Giant Deluge" type of fire hose and pumper, and for opening local eyes to the unquestionable need for an equivalent piece of apparatus out here.

Eye witnesses credit the Giant Deluge (which was developed by the Philadelphia fire department and can pour 2000 gallons of water a minute on a fire from a distance of 300 feet) with preventing the spread of the Autocar fire to the adjoining business district. Many observers are convinced that the Giant Deluge turned the tide at a point when the fire, which had a good headstart, could have turned into a holocaust.

Whether this was actually the case or not will never be known. But there can be no doubt about the fact that a community like the Main Line, with its clustered commercial districts and large apartment buildings, needs something like the Giant Deluge. How one can be obtained we do not know at the moment. But the Times has been sufficiently impressed by it to pledge all-out support to any serious effort to make a similar piece of equipment available to the Main Line's fire companies.

The above editorial appeared in the Main Line Times, Ardmore, Pa., shortly after the Autocar fire. Reprinted by permission.

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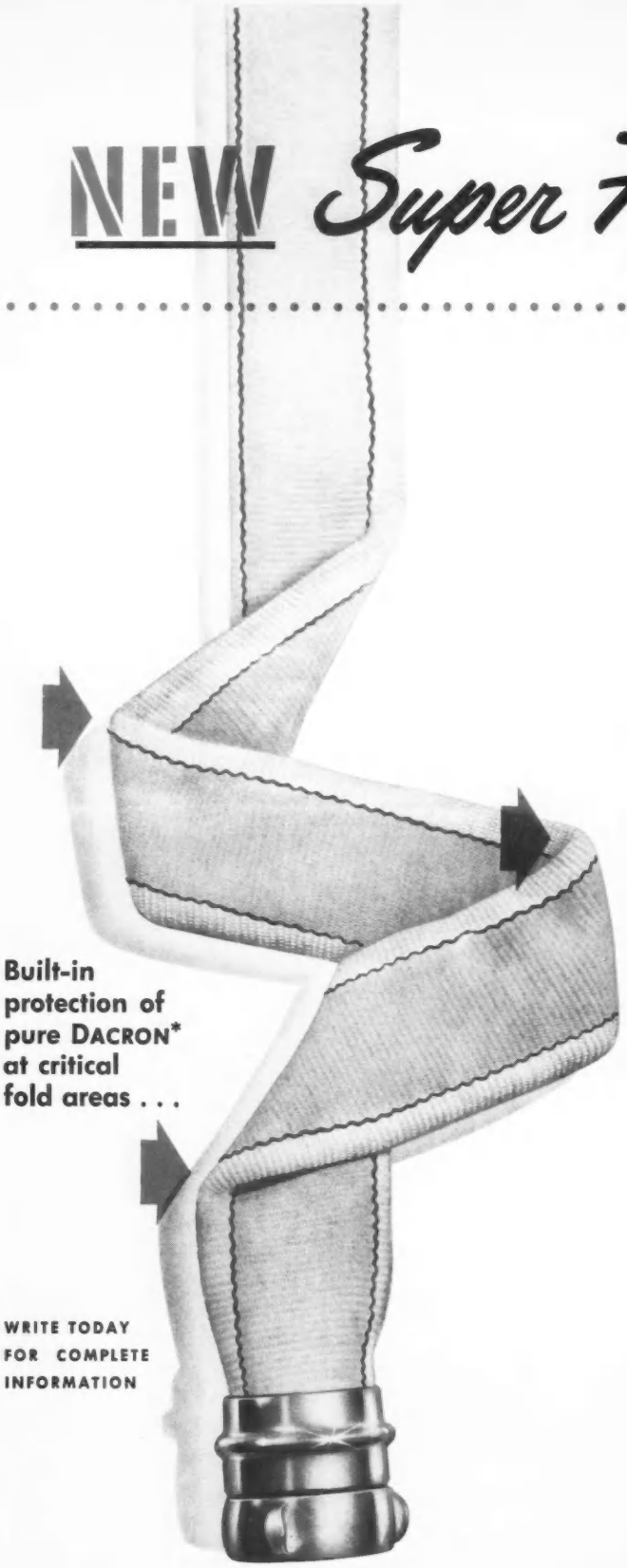

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REPRESENTATIVES IN PRINCIPAL CITIES

Firemen

Volume 24 Number 4

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HENRY S. GERE, ADVERTISING MANAGER

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Cover Photo

Despite prompt application of heavy streams by Buffalo, New York, fire fighters, estimated fire loss in the building on this month's cover was about $250,000. The fire brought 4-alarm response including 17 engine companies, 6 ladder companies, a high pressure truck and four other units. Using 3½-in. supply lines, fire fighters operated turret pipes, ladder pipes, deck guns and portable turret nozzles, while the high pressure unit threw an 1800 gpm water curtain to protect close exposures.

The brick and wood frame structure measured 135 ft. in front, 235 ft. in the rear and was about 280 ft. deep. It was divided into sections ranging in height between 1 and 4 stories, with a maximum height of 60 ft. Previously, it had been the site of a rubber reclaiming company which moved to a new location a few weeks previous to the fire. The buildings had been protected by automatic sprinklers and a supervised fire detection system. There were adequate standpipe hose connections, and good water supply. However, on February 1, all of these services had been discontinued, although the contractor removing heavy equipment from the building did provide a watchman. The Fire Department was notified of the discontinuance of sprinkler and supervised fire detection service, and had arranged for workers using cutting torches to maintain a 2½-in. line from a nearby hydrant into the plant in the event fire started. Even with this precaution, however, fire started late in the afternoon of February 16. A passer-by pulled a box alarm at 4:22 P.M., followed immediately by a telephone alarm by the watchman. Despite quick response of apparatus, Battalion Chief Robert J. Zahm, Jr., found it necessary to call 4-alarm response within 8 minutes.

Open stairways and elevator shafts, large open areas, rubber dust, oil deposits on walls and floors were some of the factors which led to rapid and heavy fire spread. Exposures were protected by good application of heavy streams. (Cover photo by Buffalo *Evening News*. Fire report based upon information submitted by Battalion Chief Robert J. Zahm, Jr., 3rd Battalion, Buffalo Fire Department.)

Annual Meeting

The Hotel Statler in Los Angeles, California, will be headquarters for the 61st Annual Meeting of NFPA, May 20–24. Arrangements already made indicate that it will be one of the most productive and successful meetings in the history of the Association. Chief William L. Miller of the Los Angeles Fire Department and Chief Keith E. Klinger of the Los Angeles County Fire Department have lent their assistance to the active committees now making local arrangements for the 5-day meeting.

A tentative program will be published in the April issue of NFPA *Fire News*, but here are some of the high lights to be featured. On Monday, May 20, there will be simultaneous meetings of the Aviation Seminar, the Fire Marshals' Section and the Electrical Section. Two General Sessions will be held on Tuesday; a single General Session on Wednesday morning with the afternoon free for excursions and other social events; Thursday and Friday will also feature General Sessions in the morning and afternoon.

Fire department members in uniform may attend any of the general sessions without paying the registration fee. All of the sessions will offer new and vital information on fire protection, but fire fighters will perhaps be particularly interested in the Second General Session on Tuesday afternoon, May 21. Among the topics to be covered are aircraft rescue and crash fire fighting, testing of foam crash trucks, specifications for motor fire apparatus, a new standard on fire hose, dust explosion hazards and other important subjects.

Other sessions of the meeting also will feature timely reports and discussion on new techniques of fire protection, fire prevention and fire control. In addition, there will be ample opportunity for members and guests of the Association to meet and exchange ideas and information on items in their individual fields of interest.

"OPERATIONS RESEARCH"

by Horatio Bond, Chief Engineer,
National Fire Protection Association

A scientific approach to the study of operations has been of considerable value to the military services and to business organizations. Here is a discussion of the possibility of applying these techniques to studies of fire service operations.

IF YOUR fire department gets enthused about "operations research" and tries to do something about it, it is well to know what can be done. Or, if some outside agency suggests applying operations research techniques to the fire department, it may be difficult to see at first just what these techniques are and how they are used. The editors of FIREMEN have asked me to make a brief report on this often misunderstood subject.

I am happy to report that fire departments should give operations research sympathetic consideration, in spite of the possible complications and difficulties.

I first heard about operations research during World War II. This may not have been the first use of operations research, but it was one of the more important ones. The British had a terrible threat with submarines lurking around their coasts, sinking ships in spite of the best efforts of the British air and naval defenses. The situation was so desperate that the military people were willing to listen to almost anyone who could make an improvement in the situation.

Accordingly, teams of scientists (who knew little or nothing about air or naval military operations) were assigned to look at the problem. They had an advantage because they weren't harassed with the day-to-day details of the defense operations and could look at the problem objectively. To make a long story short, their studies resulted in the air and naval arms adopting techniques which tremendously increased the "kill" of enemy submarines.

This was a spectacular result of a new technique. It is modestly described, by proponents, as simply the scientific method being applied to an operational problem.

Operations research was used extensively later by American military agencies also. Following the war, the technique has begun to be applied to business operations. From this experience it is clear that many fire department problems could be usefully considered for operations research studies.

At a Fire Research Correlation Conference sponsored by the National Academy of Sciences–National Research Council in Washington last November, Dr. Philip Morse, Professor of Physics at the Massachusetts Institute of Technology, commented that operations research might be of value to fire departments. Dr. Morse spoke from a considerable background of operations research experience in connection with military problems. We have his judgment, therefore, that fire departments, like military and business organizations, could look into this subject with advantage.

Both military and business people have had difficulty in getting started on operations research work because the principal practitioners of operations research have been scientists. Scientists, people in the military forces, people in business, and people in fire departments often use an entirely different language. The operations research man gets to express himself in mathematics. The mathematics is often quite complicated because the problems to which it is applied are complicated.

This is one of the difficulties encountered in getting started on operations research work. Another is the fact that operating people usually have some operational studies already going, and they might at first conclude that there was nothing new for them in an operations research program.

The testimony of practically everyone with experience in operations research programs is that there are difficulties in getting the program started, accepted and defined. Therefore, it is appropriate to point out that a program involves quite a problem just with regard to getting a meeting of minds of those participating. But there is also testimony that the possible results justify the trouble.

So far, I have said nothing about the particular operations of a fire department which might be given attention in an operations research program. I have no particular operations in mind as this is written. It is important to recognize that a decision as to which operations to study may in itself involve some operations research because obviously some things a fire department may do are more important than others.

If a fire department were trying to increase the effectiveness of its fire prevention operations, the studies would cover one set of factors. If the operations which are affected by locations of stations, manning of companies, type of apparatus, and things like that, are to be studied, the program would be set up another way. It will be recognized that there are possibilities for many different studies in connection with various fire department operations.

Operations research also involves expenses which may appear to be relatively high. It should be recognized that the cost of solving a single problem (based on a survey of operations research work in business and industry) has ranged from $10,000 to $100,000. In industry it was found to cost, on the average, something over $20,000 per year for each professional man in an operations research group. Operations research, therefore, is obviously not for the small city fire department. It would be quite feasible, however, for operations research on fire matters to be handled by a group of municipal fire departments, sharing the costs, or by a state agency.

According to operations research people themselves, the most serious difficulty is likely to be the lack of enough scientifically trained people in the field of

operations research. The members of operational research teams must have good scientific background, it is true, but also needed are people with proper personal qualities of imagination and ability to work with other people. These are not so easy to find. Most of the present operations research people with experience are working for the military, for large industries and for a few consulting firms.

If a fire department is interested in an operations research program, probably the most practical step to take is to approach one of the universities which have some members of their faculties giving attention to operations research. The principal schools are Carnegie Institute of Technology, Case Institute of Technology, Ohio State University, University of California at Los Angeles, Massachusetts Institute of Technology, Johns Hopkins University, Cornell University, Columbia University, University of Chicago and University of Pennsylvania.

One or two of the schools in this list offer consulting services in connection with their programs in operations research. Some of the others are in a position to offer courses to people with the requisite academic qualifications to pursue operations research.

Some of them offer summer short courses in the subject. One of the possibilities would be that a fire department could send some men to take what is offered in the short courses preliminary to consideration of an operations research program in the department. Even for these summer courses, considerable background in physics and mathematics is required, but some fire departments have men who could qualify.

Emergency Care of Injuries and Burns

RESPONSE of readers to articles on "first aid" which appear in FIREMEN magazine, indicate that many fire fighters and members of rescue squads regard this subject as one of the most important. Moreover, there appears to be considerable uncertainty about how much treatment a non-medical person should render to a victim of injury or burns before a physician or other trained medical personnel can give professional treatment.

Accordingly, the statements below, released last month by the American Academy of Pediatrics, provide some welcomed information. They define the types and extent of treatment which can and should be given to children who are victims of injury or burns. Fire fighters and rescue squad members should memorize these basic principles of treatment.

The Committee on Accident Prevention of the American Academy of Pediatrics, in cooperation with the Surgical Section of the same organization, has prepared statements to cover the emergency management of childhood skeletal trauma and burns. Both of these statements are endorsed by the Committee on Trauma of the American College of Surgeons and have been approved by the Federal Civil Defense Administration.

Emergency Care of Childhood Skeletal Trauma

1. Evaluate and splint where they lie before moving. Do not attempt reduction.
2. Move cervical (*neck*) injuries face up on a rigid support with manual traction applied gently by cupping chin at the time of moving. Sand bags on either side of the neck to prevent turning, if possible.
3. Spine injuries should not be flexed in transportation.
4. Lower leg injuries transport in pillow strapped with belt.
5. Upper leg injuries transport with both legs and trunk bound to board without circulatory interference.
6. Lower arm injuries transport with splint such as rolled newspaper, gentle compression wrapping and sling.
7. Upper arm can be bound to chest with lower arm supporting in sling.
8. Open injuries or open wounds cover with sterile dressing, do not dust with antibiotic, but systemic (*internal*) antibiotic is useful. Do not attempt to retract bone back under skin. Get to surgical care promptly.
9. Do not cover distal (*furthest from joint*) tips of extremities if it can be avoided thus allowing a circulation check to be made from time to time.

Emergency Care of Burns

1. Burns are due to thermal agents (scalds or fire); chemical agents (battery acid or lye); radiation (sunburn or nuclear); and electrical energy.
2. Even small burns may be followed by infection, lockjaw, excessive scarring and disfigurement. Large burns may represent an immediate threat to life from shock. Arrest of the circulation and respiration may occur following electrocution.
3. Flames should be smothered; children who have been scalded should have their clothing removed immediately; chemical burns (except phosphorus) should be washed with large quantities of running water. Chemical burns of the eye should be flushed with saline solution or water. Patients should be removed from source of radiant energy.
4. Fresh burns are relatively clean. They should be covered by a clean cloth immediately and should not be uncovered until the patient is delivered to a hospital emergency room or a doctor's office. Such covering should be loosely applied without constriction.
5. Ointments, greases, powders, etc., should not be used in the emergency treatment of burns. Leave this management to the physician who will care for the patient.
6. Shock may be combated by keeping the patient flat, reassuring him, and keeping him warm during transportation to the hospital.
7. Pain is usually not a serious problem in the emergency treatment of a burn and drugs for pain should not be administered except by the physician who will care for the burn.
8. Patients with burns of the face, hands, feet, or areas surrounding a joint as well as any burn equivalent to more than 5 percent of the body surface should be hospitalized after emergency treatment.
9. Electrical burns accompanied by electrocution and failure of respiration and circulation should receive artificial respiration for an indefinite period and until ordered to stop by a physician.

The Operation and Behavior of

Fire Pump Relief Valves

by Stuart D. Klinger, Beloit, Wisconsin

A graduate of Beloit College and a mechanical engineer by profession, Mr. Klinger has maintained active interest in the fire service for twenty years. In this, his first contribution to FIREMEN *magazine, he calls attention to one of the important fundamentals of fire pump operation . . . the functioning and purpose of the relief valve.*

MANY a fire pump operator has been puzzled by the seemingly erratic behavior of a relief valve, in spite of his knowledge of constructional features and the proper method of setting such valves. On the fire ground, this can be very disconcerting; however, a thorough understanding of what is happening, and how it can be corrected, should give every pump operator confidence in himself and in his apparatus.

There are two ways of using a modern relief valve:

1. The relief valve may be operated as a pressure regulator. In this case, the valve is set at the desired engine pressure. (Relief valves should always be set when water is flowing through the hose line or lines.) The engine speed may be just sufficient to give the required pressure, or, as is more often the case, the engine speed will be considerably higher than that required to produce the desired pressure.

Under these circumstances, the relief valve will be constantly operating, and by-passing water from the discharge to the intake side of the pump. There seems to be little to recommend this method of relief valve operation. It is wasteful of gasoline, causes undue wear, may result in engine heating, and invites trouble from surging, as will be discussed later.

2. The relief valve may be operated as a "pop-off," or safety valve. In this case, the *pump operator* is the pressure regulator. The relief valve is set for a pressure somewhat in excess of the desired pump pressure (say 10 pounds higher), and the engine speed is then reduced until the required pump operating pressure is obtained. Under these circumstances, the pump is supplying the required amount of water at the given pressure, but no more.

As long as the hose lines originally supplied are not shut down, the relief valve does not operate, but is *ready* to do so as soon as a line is shut down. It therefore performs in the same manner as a safety valve on a steam boiler, remaining closed under normal pressures, and opening under predetermined excessive pressures.

SUPPOSE a hose line is shut down; the pump pressure will build up, and the relief valve will open at the pressure for which it was set. An alert pump operator will observe the rise in pressure, and will probably hear the rush of by-passed water as his relief valve comes into operation. He accordingly knows that a line has been shut down, and reduces engine speed so as to again give the desired operating pressure to the hose lines remaining in use. If the inoperative hose line is again put into operation, the pump operator will observe a drop in discharge pressure, and will accordingly increase engine speed until the desired pump pressure is again obtained. We may say that the pump operator is thus performing as a pressure regulator, and the relief valve is performing as a safety valve.

Let us illustrate this method of relief valve operation, by assuming that the hose layout and nozzles being used at a certain fire require a pump (engine) pressure of 150 pounds per square inch. By following manufacturer's instructions, the pump operator will set his relief valve (after water is flowing) to open at, say, 160 pounds. He will then reduce engine speed until the desired pressure of 150 pounds is obtained. Under these conditions, the relief valve will be closed, and will be exerting no control over the pump.

Now, let's say that an additional hose line is attached, and the line charged. Engine pressure will then drop to, say, 120 pounds. The pump operator (pressure regulator), noting the drop, increases engine speed until 150 pounds is again obtained.

During the course of fighting this fire, it is deemed advisable to move a certain hose line, and this line is shut down at the nozzle preparatory to moving it. Engine pressure immediately rises to, perhaps, 180 pounds, and the relief valve opens, to relieve the excess pressure. The operator, hearing the relief valve come into operation, and observing the rise in discharge pressure, will reduce engine speed until the pump pressure is again 150 pounds. This adjustment allows the relief valve to close, and to reassume its original role as an ever-ready safety valve.

This last-described method of relief valve operation saves gasoline, reduces wear on the engine, transmission, pump, and relief valve, and keeps the operator better informed concerning the opening and closing of hose lines.

It is widely recognized in the fire service that pumps in operation should always be attended. Some fire officials may argue, however, that lack of manpower makes such attendance impossible for their particular department. Even under these conditions, the method of relief valve setting being advocated here is still the better of the two methods to use; the lack of a pump operator means only that, if a line is shut down, the *nozzle* pressure of remaining lines will increase by 2 or 3 pounds. Meanwhile, when all lines *are* in use, the engine and pump speed are no more than required,

and the relief valve is not in operation, but is ready to take over if required.

NOW that we are familiar with the two methods of relief valve operation, suppose we consider some other aspects of relief valve behavior.

Some firemen assume that, if a relief valve is set to open at a given pressure, the pump pressure should never rise above this value; such a rise is frequently interpreted as being caused by a faulty valve. Actually, once the opening pressure of the relief valve is exceeded, increasing the engine speed or shutting down hose lines will be accompanied by increasing pressures, but at a reduced rate over what would result were the relief valve not operating at all. Say we are supplying two hose lines at 100 pounds pump pressure, and that the relief valve is set to open at 110 pounds. One line is then shut down; due to the resulting increase in pressure, the relief valve will open at 110 pounds, but the pressure may go up to, say, 120 pounds before levelling off. With no relief valve, the pressure might have shot up to 150 or higher. This behavior is quite logical if you consider that the relief valve passages are of fixed size, and that the more water we attempt to by-pass through the valve, the higher will be the pressure required to do this work.

Another phase of relief valve operation which merits discussion, is the action which we may call "surging." Suppose the pump is supplying one or more lines, and everything is going smoothly; suddenly compound and discharge gauges start fluctuating wildly, a disturbing, rhythmic noise comes from the region of the pump, and the hose lines, particularly the soft suction, visibly expand and contract, in harmony with the noise and fluctuating needles. The pulsing of the soft suction may very well deceive the fireman attending the pump into presuming that a faulty hydrant or some other component of the water supply system is the source of the difficulty. Experience will teach that the condition can be corrected simply by reducing engine speed, but what causes this erratic behavior in the first place?

Well, our old friend, the relief valve, is the culprit, though it has little choice in the matter. The difficulty usually starts when a hose line is shut down quickly. This results in a rapid build-up of pressure, which slams the relief valve open; due to the speed of opening, the valve overtravels, and opens further than is required. This overtravelling allows more water to be by-passed than is needed to maintain the desired pressure. Consequently, the relief valve spring takes control because of the now-too-low pump pressure, and slams the valve shut. Then the pump pressure builds up again, and the cycle is repeated, and will continue until the offending hose line is reopened, or the engine speed reduced, thereby reducing the pressure below that for which the relief valve is set.

The expanding and contracting of the soft suction, during surging, as described above, is due to the sudden inrush of high pressure water (from the discharge side of the pump) into the intake side of the pump, and consequently into the suction hose, at the instant of relief valve opening.

The ominous noise which was coming from the pump, can be attributed to the periodic rushing of by-passed water through the relief valve, as it opens and closes.

It is difficult to predict when this surging, or "hunting," of the relief valve will occur, but it becomes quite likely if the nozzles are abruptly closed, thus producing the initial surge that starts the ball rolling. A dirty, sticky relief valve is also an invitation to trouble, and proper cleaning, oiling, and maintenance of the valve mechanism, as recommended by the manufacturers, is certainly a desirable practice.

Actually, predicting relief valve surging is not particularly important; the important thing is to be able to recognize and correct the difficulty.

Pump operators who use the method of relief valve operation advocated in this article, will suffer only minor annoyance because of surging, for they will immediately reduce engine speed, to give proper pressure, and surging will level off, thus restoring smooth operation.

(The term "relief valve," as used in this article, is used to describe the assembly comprising the relief, or control valve, and the larger by-pass, or "churn" valve.)

Maryland Pump Schools

THE University of Maryland Fire Service Extension, headed by Director Robert C. Byrus, has announced its series of pump schools for 1957. These popular training courses feature instruction by representatives of fire pump manufacturers who conduct training with working models and fire apparatus. Listed below are the dates of the pump schools and other training scheduled to be held at the University in College Park, Maryland. Complete information may be obtained from Director Byrus at that address.

Hale Pump School, May 17, 18; Waterous Pump School, May 24, 25; American LaFrance Pump School, May 31, June 1; Seagrave Pump School, June 7, 8; American Marsh Pump School, June 14, 15; Fire Service Hydraulics Short Course, June 27–29; Twenty-Fourth Annual Short Course, September 3–6.

Fire Demands Water!

WHEN the Chicago Fire Department, under the direction of Chief Fire Marshal Albert H. Petersen, had to combat a grain elevator fire last January, it made full recourse to available water supply.

Second Deputy Chief Fire Marshal James F. Lahey reports that 58 land engines pumped at a rate of 29,000 gpm for a total of 20,284,000 gallons, and that two fireboats pumped at a combined rate of 15,000 gpm for a total of 50,900,000 gallons. Estimated water used in the fire attack therefore amounted to a grand total of 44,000 gpm or 70,184,000 gallons.

"Why is it they always send up the married ones?"

HIGHLIGHTS of the 29th FDIC

SOME 2,224 members of the fire service from 29 states, the District of Columbia, and Canada attended the 29th Annual Fire Department Instructors' Conference, Memphis, Tennessee, February 19–22. Again serving as co-chairmen for the Conference were Richard E. Vernor, Manager, Fire Prevention Department, Western Actuarial Bureau, Chicago, Illinois, (Chairman, NFPA Board of Directors) and Host, Chief John C. Klinck of the Memphis Fire Department. The FDIC, sponsored by the Western Actuarial Bureau and the Memphis Fire Department, is one of the most popular and best attended meetings of the fire service year.

With Chairman Vernor supervising the fast-moving program and Memphis firemen rendering their usual outstanding courtesy in providing service to all of the Conference guests, the four-day session provided the high standards of information and service for which the FDIC is renowned. Space does not permit reporting of all the activities, but some of the featured speakers and highlights are described below.

Kickoff speaker on the first day was Roi B. Woolley, Editor of *Fire Engineering* . . . He was followed by Engineer Jack A. Bono of Underwriters' Laboratories, Chicago, Illinois, who discussed the new method of classification of fire extinguishers . . . At the luncheon on Tuesday, Norton T. Ames, President, Wisconsin Council of Firemen's Associations, analyzed the typical volunteer fireman and the importance of public relations to a volunteer fire department.

Chief Earl R. McDaniel of Lexington, Kentucky, discussed the important human characteristics of a good fire department administrator . . . Harold E. Kuhlman of the Oklahoma Inspection Bureau reported on the activities of the Fire Research Committee of the National Research Council . . . Calvin H. Yuill of the Southwest Research Institute discussed how research and development were being applied by governmental and private organizations toward fire control . . . Deputy Chief Louis E. Vogt of the Rochester Fire Department described the tests of heavy stream nozzles conducted last year by the NFPA-IAFC Committee on Fire Department Equipment.

Loren S. Bush, Board of Fire Underwriters of the Pacific and Vice President of NFPA, told a dramatic story of the Malibu fires in California last December . . . Chester I. Babcock, Manager, NFPA Fire Records Department, discussed fire prevention lessons of the large loss fires of 1956 . . . H. E. Whitmire of Whitmire Research Laboratories described the hazards of insecticidal chemicals . . . Raymond J. Casey of the National Automatic Sprinkler and Fire Control Association outlined the performance record of automatic sprinklers over a 30-year period and listed the rules for fire departments to follow in handling sprinkler systems during and immediately after fires . . . Chief Joseph A. Giammatteo of the Glen Echo, Maryland, Fire Department reported on the history of the development of fire service communications.

The characteristics of imminent wall failures and other structural failures were described by Charles L. Roblee, Fire Service Instructor of Purdue University . . . Robert F. Hamm of the Indiana Rating Bureau described the growth and influence of FDIC during its 29 years of existence . . . Chief Klinck described the problems his fire department faced last year in handling a 70,000 ton pile of corncobs which became involved by a fire that lasted for 23 days before extinguishment was completed.

Spaced throughout the four-day program were some interesting panel discussions, including the following: Robert C. Byrus, Director of Fire Service Extension, University of Maryland, headed a panel discussion on "post mortems" of fires. Other panel members included Chief Earl Levy of Tallahassee, Florida; Chief Fire Marshal Albert H. Peterson, Chicago, Illinois, Fire Department; and Chief O. E. Hirst of the Galena, Illinois, Fire Department.

Current types of firemen's training programs at state, local, and regional levels were discussed by a panel headed by FDIC Secretary Harry Wolff of the Western Actuarial Bureau and including Keith Royer, Iowa State College; Chief W. H. Barnett, Florida Fire College; and Warren Y. Kimball, Manager, NFPA Fire Services Department and Editor of FIREMEN magazine.

Rural fire problems were discussed by a panel including Abe Gent of the Illinois Inspection Bureau; Harry J. Corcoran, Iowa Inspection Bureau; Chief Lynn C. Ray, North Park Fire Department, Rockford, Illinois; and L. E. Shingledecker, Nationwide Insurance Company.

A panel discussion of home inspection programs included Chief Lester R. Schick of Davenport, Iowa; Wayne Jenkins of the Ohio Fire Marshals' Division; Chief Dan McDermott of Epworth, Iowa; Chief Rod Porter of Winnetka, Illinois; and Batt. Chief Joseph F. Meskill of Philadelphia, Pennsylvania.

"Scouting in Action" was the subject of a panel discussion led by George K. Myers, Civic Relationships Director of the Boy Scouts of America, and including Don Haight of the Minneapolis Fire Department;

Chief J. C. Klinck of Memphis, Tennessee, receives the NFPA Fire Prevention Week Contest Grand Award from NFPA Board Chairman Richard E. Vernor, during the 29th Fire Department Instructors' Conference. Memphis took top honors for the seventh time in the history of the contest.

A series of fires were set in this large frame dwelling to demonstrate efficiency of fog application. Fire attack was made with hand lines equipped with fog nozzles, by master stream of 500 gpm fog nozzle on a ladder pipe, and then attack was made with wet water foam.

Chief D. A. Meek, Jr., of West Point, Mississippi; Dale Auck, Federation of Mutual Fire Insurance Companies; and Chief George R. McAlpine of Oklahoma City, Oklahoma.

On Tuesday afternoon new evolutions were demonstrated under the direction of Joseph I. Fetters, Administrative Assistant, University of Missouri, (Chairman, NFPA Committee on Firemen's Training), assisted by Thomas Godfrey of the St. Louis, Missouri, Fire Department; and W. Thomas Owens, Instructor, University of Maryland. Demonstrations included methods of extinguishing fires in "scenic-cruiser" buses, a remote control ladder pipe, and a fire department road-e-o.

On Wednesday afternoon conference guests adjourned to Woodlawn Avenue in Memphis where a four-room, frame house was burned and extinguished in a series of demonstrations. Fire fighting attack was by hand lines equipped with fog nozzles, and then master fog streams on ladder pipes supplementing hand line attack (see illustrations).

One of the new pieces of apparatus in Memphis is this hydraulically operated water tower supplied by ten 3-in. lines. (See page 27.)

Fire Hazard Properties of Aviation Fuels

A PROPOSED text on the fire hazard properties of aviation fuels has been prepared as Aviation Bulletin No. 177 by the NFPA Committee on Aviation and Airport Fire Protection. The 8-page, 8½ by 11 in. bulletin provides some concise information on these flammable liquids which should be of interest to fire fighters.

Principal features of aviation fuels mentioned and evaluated include the following: susceptibility to or ease of ignition, flash point, flammability limits, vapor pressure, autoignition temperature, distillation range, electrostatic susceptibility, severity of fire after ignition, heat of combustion, rate of flame spread, fire fighting aspects, specific gravity of the fuels, and their solubility in water.

Copies of Aviation Bulletin No. 177 may be purchased for 50 cents each by writing to the NFPA Publications Department.

Sparky Masks Available

FIRE departments and other organizations who specialize in fire safety instruction for youngsters, should be able to make good use of the new rubber Sparky masks now being distributed. The masks, available only in adult sizes, are realistically shaped and marked to duplicate the face and head characteristics of the nationally-known Sparky, the Dalmatian dog who serves as a symbol of fire prevention in the NFPA's year-round campaign.

The mouth of the mask has an opening so that the wearer's voice may be heard distinctly. The rest of the Sparky uniform consists of regular fire department denims, boots, white shirt, blue tie and red suspenders.

Masks may be obtained for $1.00 each from the NFPA Publications Department, 60 Batterymarch Street, Boston 10, Massachusetts.

New Pumper for Willoughby

THE Fire Department of the City of Willoughby, Ohio, recently received this new 1,000 gpm American LaFrance pumper. It carries 2,000 ft. of 2½-in. hose, 800 ft. of 1½-in. hose and a 200-ft. reel of booster hose. There is a 300-gallon tank, a 1½-in. rear discharge outlet and a gated 2½-in. intake at the rear. All minor equipment is carried in the lighted compartments. The pumper is equipped with two-way radio and has speakers for a public address system.

The Department, headed by Chief Reed Fairley, has two 10-man fire companies with part-paid and volunteer personnel.

Standard Heavy Streams from Ladder Pipes

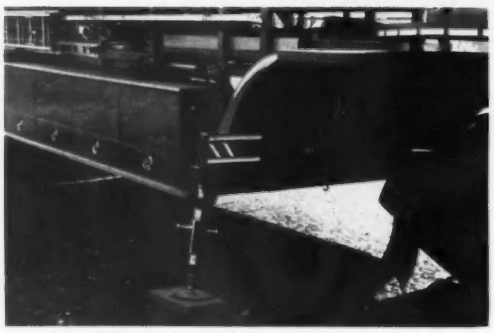
TESTS recently were conducted by the Boston Fire Department's Training Division headed by Assistant Chief William Terrenzi, in cooperation with the NFPA Fire Service Department. Studies were made of standard streams from a bed ladder pipe on a 3-section 100-ft. steel aerial ladder at approximately 40 ft. elevation, and from a fly ladder pipe at 80 ft. elevation.

All photographs were taken from the same location so that pictures of the streams could be compared. Ladder pipes were supplied through 3-in. lead hose, 90 ft. past the siamese for the bed pipe and 100 ft. past the siamese for the fly ladder pipe. Siamese was of 2-way gated type supplied by two 3-in. lines from pumps near the ladder. (See page 18.) Had 2½-in. hose been employed, the two-way siamese would have been inadequate to supply the larger nozzles and a three-way siamese would have been essential for proper performance.

Standard nozzle pressures of 80 lbs. for solid streams and 100 lbs. for fog nozzles were employed, although it was realized that under fireground conditions slightly lower pressures could be used. However, if the length of line is such that pressure at the siamese is 20 lbs. less than that needed to provide standard nozzle pressure, it is recommended that an additional pumper be used. (*Photos by Raymond T. Lonergan, Photographer, Boston Fire Department.*)

Demonstration of simultaneous operation of bed ladder pipe at 40 ft. elevation and fly ladder pipe at 80 ft. elevation. Tips used were 1½-in. on the bed (600 gpm at 80 psi) and 1⅜-in. on fly (500 gpm at 80 psi). These are the smallest sizes carried. The superiority of the 1½-in. tip over the 1⅜-in. tip is clearly demonstrated as each are operating at the same nozzle pressure. Where pumping capacity permits, it would be desirable to use the 1⅜-in. tip on the bed ladder and 1½-in. tip on the fly ladder. The ladder was set for 70 degrees but with two streams operating, the back thrust brought the ladder to 71 degrees 41 minutes.

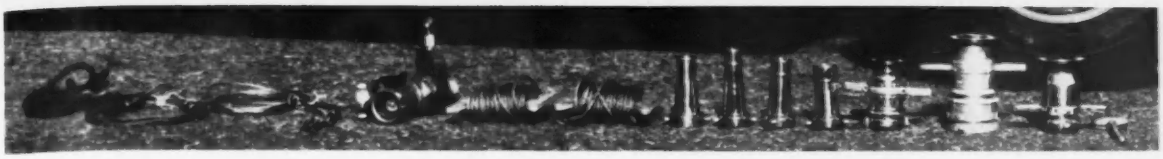
Assistant Fire Chief William Terrenzi of the Training Division shown with Boston Fire Department personnel who carried out tests. Electric megaphone carried on the apparatus was used to direct photographer and pump operators during tests.



Outrigger jack set on metal ground plates to increase ground contact on an uneven surface. Outrigger beam marked with reflective stripes (as is turntable) to prevent accidents.

Streams from permanently mounted bed ladder pipe on 3-section 100-ft. aerial with nozzle approximately 40 ft. above street. Specifications for this pipe called for a flow rating of 900 gpm with not over 15 psi loss in device. For test purposes, loss in pipe was arbitrarily assumed to be 10 psi in each instance.

This 1½-in. solid stream (600 gpm at 80 psi) is considered to be the minimum effective heavy fire stream from permanently mounted bed ladder pipe. Stream is effective at approximately 80 to 100 ft. elevation at proper angle for penetration. Nozzle pressures up to 100 psi would be desirable where pump pressures and layouts permit.



Equipment used in tests (left to right): (1) Rope "hose line" to secure hose to ladder. (2) Steel leaders attached to nozzles. (Rope leaders could burn during a fire.) (3) Two-way gated siamese used at ground level to control supply to pipe. (A pressure gage was inserted in line at siamese during tests.) (4) Halyards used to direct elevation of stream. (5) Nozzle tips: 1⅜, 1½, 1⅝, 1¾ (500, 600, 700, and 800 gpm). (6) 500, 700, 1000 gpm peripheral jet adjustable fog nozzles. (7) Spanner.

Deck turret nozzle on ladder truck supplied by two pumpers through three 3-in. lines delivering 1250 gpm at 80 psi. Effective reach of stream was considerably beyond end of storage shed in background.

The 1⅝-in. solid stream, 700 gpm at 80 psi, is generally the best choice for use with the bed ladder where reach and volume are required. This is the maximum stream that can normally be supplied by one pumper through two 3-in. or three 2½-in. lines.

Demonstration maximum reach of 1⅝-in. stream, 80 psi, from permanently mounted bed ladder pipe at 40 ft. elevation with one pumper delivering 143 psi at the siamese with 185 psi pump pressure. Building is approximately 200 ft. long.

(*Left*) JN-200 fog nozzle with 30 degree fog pattern delivering approximately 700 gpm at 100 psi nozzle pressure through permanently mounted bed ladder pipe (40 ft. elevation). Fog cone selected to provide sufficient break-up and to permit stream to pass through a window. This stream required 163 psi at the siamese.

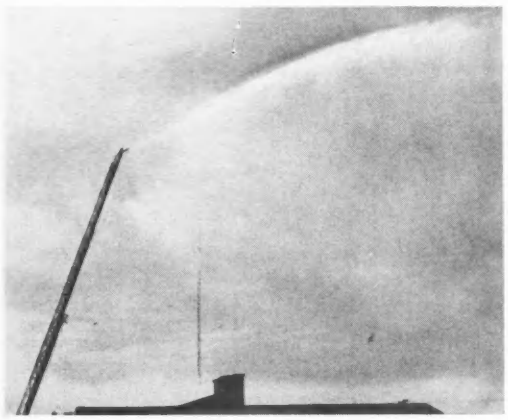
(*Right*) 1000 gpm "Fog Hog" fog nozzle with 30 degree fog pattern operating at slightly below 100 psi nozzle pressure. Two pumpers operating at 210 psi provided 182 psi at the siamese.

The 1 3/8-in. tip (500 gpm at 80 psi) is the smallest solid stream tip supplied for ladder pipe service in the Boston Fire Department. It is supplied by one pumper with a normal layout but the 1 1/2-in. tip would be preferred. At 80 ft., 156 psi was required at siamese and 175 psi at pump.

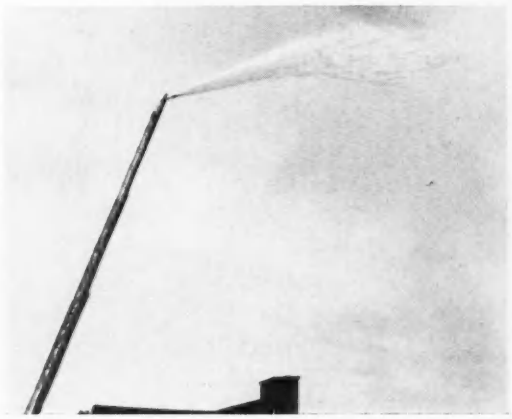
Fly Ladder Pipe

Streams from portable fly ladder pipe (15 psi loss at 600 gpm) operated at 80 ft. elevation. Aerial set for 70 degree angle on inclinometer but tended to assume slightly higher angle due to back thrust of heavier streams.

The 1 1/2-in. tip (600 gpm at 80 psi) is considered a standard ladder pipe solid stream tip for the fly ladder of a senior aerial ladder. The improvement in reach and effectiveness of stream may be readily observed. This stream was obtained with 170 psi at siamese and 195 psi at pump.



The 1 5/8-in. tip (700 gpm at 80 psi) is the most effective solid stream from the fly ladder pipe but may require lines from two pumpers for use outside of areas served by high pressure water mains. Pressure at the siamese was 185 psi with 210 at the pump.



The JN-200 fog nozzle discharging approximately 700 gpm at 100 psi at 80 ft. elevation while adjusted to a 30 degree pattern. It is recommended that where fog is required on a fly ladder pipe above 60 ft. elevation that the 500 gpm fog nozzle be the size employed.

Recommended Procedures for Obtaining Good Ladder Pipe Streams

1. Place pumper as close to siamese as possible. If hydrant is over 250 ft. away use a relay pump at base of ladder.
2. Use two 3-in. or three 2 1/2-in. lines from pumper to siamese.
3. For bed ladder pipe the 1 5/8-in. tip (700 gpm) or 700 gpm fog nozzles provide desirable streams.
4. For fly ladder pipe the 1 1/2-in. tip (600 gpm) or 500 gpm fog nozzle are acceptable streams.
5. Nozzle pressure should be 80 lbs. for solid streams and 100 lbs. for fog nozzles.
6. To obtain desired nozzle pressure provide approximately twice the nozzle pressure at the siamese at the base of the ladder.
7. To estimate pressure requirements to the siamese, use ordinary friction loss calculations for layout from pumps to siamese.

For example, with 80 lbs. wanted at 1 5/8-in. tip — 700 gpm. Provide 160 lbs. at siamese. FL with three 2 1/2-in. lines between pump and siamese will be 13 lbs. per 100 ft. 2 1/2-in. hose. Pump 200 ft. away will operate at 186 lbs.

Minutes Ago This Jet Was Ablaze

This Jet Fighter skidded over half a mile and burst into flame at Worcester airport. In minutes Rockwood Double-Strength FOAM was blanketing the blaze. A dangerous fire was soon under control — because the airport and Worcester Fire Departments were prepared.

As you know, the danger of highly flammable liquid is not confined to aircraft. Every day tank trucks carrying volatile fuels move in and out of your city. Rockwood Double-Strength FOAM can help protect your city from this potential danger.

Rockwood Double-Strength FOAM applied with a Rockwood FW Eductor fights flammable liquid and other fires of the same type fast and sure. Three parts mixed with 97 parts water forms a solid FOAM blanket that quickly reseals itself. The Rockwood Eductor with the new FW metering check valve and the Type SG60 nozzle applying the FOAM make short work of fire.

Be prepared. Put this fire fighter to work. Specify Rockwood FW Eductor when you order a truck. Write Rockwood Sprinkler Company, 1531 Harlow Street, Worcester 5, Mass.

The Variable FW Metering Check Valve on the Rockwood Eductor is highly versatile (standard equipment). Both are incorporated in a single unit. Material is metered into the hose line in any proportion from 1% through 6%.

ROCKWOOD SPRINKLER COMPANY

Engineers Water . . . to Cut Fire Losses

Distributors in all principal cities

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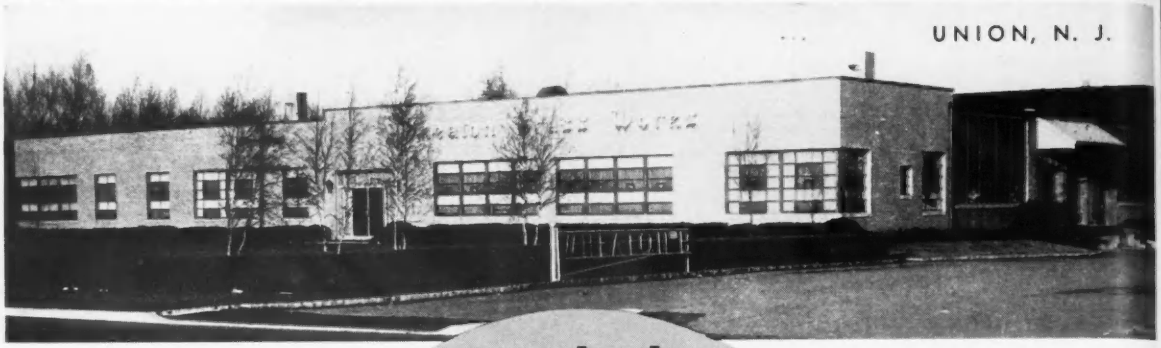
UNION, N. J.



protects its property *Automatically* gets better FIRE and BURGLARY protection and SAVES $7,500 A YEAR...

When we built our new plant, 24 hour-a-day protection was considered essential. We found the headache-free answer in ADT Automatic Protection Services, which, in our opinion, do the job more thoroughly, efficiently and economically than human patrols. We estimate our savings at $7,500 a year.

Robert F. Wheaton

Robert F. Wheaton
VICE PRESIDENT

Wheaton Brass, manufacturers of equipment for the petroleum industry, might be hurt seriously by a fire or burglary. The management accordingly chose ADT *Automatic* Protection Services to safeguard property, profits and employees' jobs.

The building, a model for plants of its type, is guarded by a combination of ADT Central Station Sprinkler Supervisory and Waterflow Alarm, Aero Automatic Fire Alarm, Heating Supervisory and Burglar Alarm Services.

Mr. Wheaton's statement, above, convincingly attests the great value of ADT Services in giving businessmen peace of mind based on knowledge that their properties have the best protection.

May we show you what ADT can do for you?

Whether your premises are old or new, sprinklered or unsprinklered, an ADT specialist will be glad to show how combinations of automatic services can protect your property. Call our local sales office if we are listed in your phone book; or write to our Executive Office.

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AMERICAN DISTRICT TELEGRAPH COMPANY
A NATIONWIDE ORGANIZATION
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155 Sixth Avenue, New York 13, N. Y.

Official NFPA Calendar

THE official NFPA calendar for 1958, reproduced above, is now available from Brown & Bigelow, St. Paul 4, Minnesota. The subject was painted by William C. Griffith. The calendars are available in three business sizes, 14 by 21 in., 18 by 27 in., and 29 by 43½ in., and are also available as home calendars.

Exclusive franchise rights are granted by Brown & Bigelow to one advertiser in every community. Space is provided on the calendar for imprinting the name and address of the advertiser, the name of the local fire department, and the instructions for giving a telephone fire alarm. Complete information may be obtained from Brown & Bigelow.

Sparky Lapel Tabs

ANOTHER popular Sparky item for distribution to youngsters is a new, colorful metal tab for lapels and buttonholes. The tabs will be very useful during "open house" at fire stations, and in similar activities. Quantities are available from NFPA at $2.00 per hundred, $15.00 per thousand.

THE FIRST CALL...

Will prove its Value!

All compartments open from inside or outside for fast accessibility . . . custom designed to fit your truck!

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STEEL FABRICATORS, Inc.
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BUILDERS OF SERVICE, CRASH AND LADDER TRUCKS • VOLUME AND HIGH-PRESSURE PUMPERS • SQUAD AND EMERGENCY CARS • STORAGE TANKS

Campus Safety Conference

THE Fourth National Campus Safety Conference, sponsored by the Campus Safety Committee of the National Safety Council, will be held at Purdue University, West Lafayette, Indiana, May 6 through 8, 1957. A number of NFPA members concerned with college fire safety are to assist the conference this year in the presentation of information about fire prevention and protection in college and university property. These include Dale K. Auck, Director, Fire Protection Division, Federation of Mutual Fire Insurance Companies, and Prof. John J. Ahern, Illinois Institute of Technology, both of Chicago. For a program and particulars about the conference, write to Clayton W. DeMent, Safety Engineer, Purdue University, West Lafayette, Indiana.

New Address for IAFC

THE International Association of Fire Chiefs has moved its headquarters offices from the Hotel Martinique, according to the Association's Newsletter. New address for the IAFC is 232 Madison Avenue, New York City, New York.

FEDERAL BEACON RAY

WHAT'S A LIFE WORTH

You can't place a dollar and cents value on a human life. Certainly it's worth more than the price of an adequate warning signal. The first act of **any** department at the scene of a fire is to **save lives** rather than property. Large sums are spent for special ladders, nets, chutes, resuscitators and other **life saving** equipment. The use of this equipment for fire fighting is actually secondary. The difference between the price of a FEDERAL Beacon Ray and inferior warning lights can be the price of a human life. **Don't let a few dollars deprive it of any portion of the good it can do.**

$75.00 buys the best vehicle warning light in existence — the FEDERAL Beacon Ray! If your department is one of the few not so equipped — don't delay — order **now!**

Write for catalog 300 on FEDERAL sirens and lights.

Get there quicker and safer- the life you save may be your own!

FEDERAL SIGN 8717 S. State St., Chicago 19, Ill.

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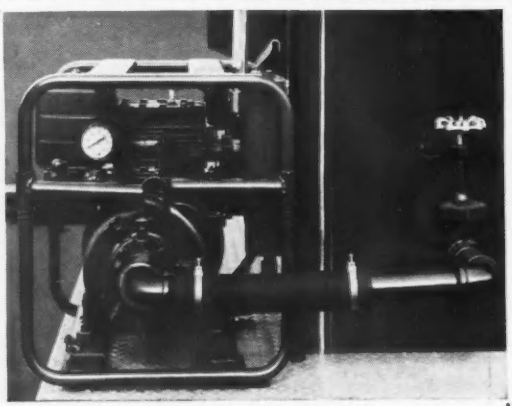
HALE

TYPE FZZ Portable Unit

Installed on Running Board of Apparatus

Picture at right shows Hale FZZ portable pumping unit (from Suction Side) neatly installed on running board of pumper. Shut-off valve at right leading from Booster tank.



Below, view of FZZ from Discharge Side showing Discharge running into Booster line.

Pump can be easily detached to fight fire direct; as standby pump; or to supply larger pumper from source of water inaccessible to the pumper.

The FZZ will supply from draft 2 capable fire streams thru 1½" lines. Performance substantially exceeds NBFU and NFPA cap. and pressure requirements.

Write for NEW FZZ folder today. Ask for Demonstration.

HALE FIRE PUMP CO. Conshohocken, Pa.

Fire Pumps in all Standard Capacities

Fire School Dates

Alabama: The 21st Annual Alabama State Fire College will be held at University, June 3–7. Write to Director M. O. Hulsey, Assistant Supervisor, Public Service Training, Trade and Industrial Education, P.O. Box 1813, University, Alabama.

California: Fire Service Instructors Workshop, Fresno, May 13–17. Fire Investigation and Arson Seminar, University of California, Los Angeles, June 10–14. Write to Director Tom S. Ward, Supervisor of Fire Training, State Department of Education, 721 Capitol Avenue, Sacramento 14, California.

Colorado: Colorado State Firemen's Convention and Fire School, Loveland, June 19–22. Write to Director A. L. Becker, Secretary, Colorado State Firemen's Association, 2224 South Stuart Avenue, Denver 2, Colorado.

Georgia: The Georgia State Fire College at Atlanta will be held May 7–8. Write to Director Harry Phillips, 46 Courtland Street, S.E., Atlanta 3, Georgia.

Idaho: The Idaho State Fire School will be held in Idaho Falls, August 15–17. Write to Chief Bert O. Brown, Fire Department, Idaho Falls, Idaho.

Illinois: The 33rd Annual State Fire College, University of Illinois at Champaign-Urbana will be held June 10–13. Regional Officers Schools at Jacksonville, April 1 to May 6 and Belleville, April 2 to May 7.

Iowa: The 33rd Annual State Fire School will be held at Iowa State College, Ames, June 18–21. Write to Director Keith Royer, Supervisor Firemanship Training, 110 Marston Hall, Iowa State College, Ames, Iowa.

Kentucky: The Kentucky Fire School will be held at the University of Kentucky, Lexington, June 4–6. Write to Director John L. Thompson, Assistant Manager, Kentucky Inspection Bureau, 940 Starks Building, Louisville 2, Kentucky.

Michigan: The 29th Annual State Fire College will be held at the University of Michigan, Ann Arbor, June 25–28. Write to Director Francis Hartman, Supervisor, Firemanship Training, 4524 Administration Building, Ann Arbor, Michigan.

Minnesota: Minnesota State Fire School will be held at the University of Minnesota Farm Campus, St. Paul, April 22–26. Write to Dr. J. O. Christianson, Director of Agricultural Short Courses, University of Minnesota, St. Paul 1, Minnesota.

Mississippi: The Mississippi State Fire School will be held at Mississippi State College, Starksville, June 24–28. Write to Director J. I. Fetters, Administration Assistant, University of Missouri, Room 101 Building T-11, Columbia, Missouri.

Missouri: The 21st Annual Central Missouri Fire Conference will be held at the University of Missouri, Columbia, July 26–28. Write to Director J. I. Fetters, Administration Assistant, University of Missouri, Room 101, Building T-11, Columbia, Missouri.

Nebraska: The 20th Annual State Fire School will be held at Grand Island, May 5–7. Write to Director Otto B. Johannes, Chairman, Fire School Committee, 2604 12th Street, Columbus, Nebraska.

Nevada: Nevada has no state fire school but does have an Itinerant Firemanship Instructor. Write to Director F. I. Wallace, State Supervisor Trade and Industrial Education, Carson City, Nevada.

North Carolina: State Fire College and Pump School, Charlotte. Write to Director Charles L. Burkett, Fire Department Headquarters, Salisbury, North Carolina.

Oklahoma: The State Fire School at Stillwater, April 22–26. Write to Director R. J. Douglas, Head Fire Protection Department, Oklahoma A & M College, Stillwater Campus Fire Station, Stillwater, Oklahoma.

South Carolina: State fire training service given by itinerant instructor in local classes. Write to Director Clarence A. Fischer, Orangeburg, Itinerant Instructor H. B. Wells, 1539½ Harrington Street, Newberry, South Carolina.

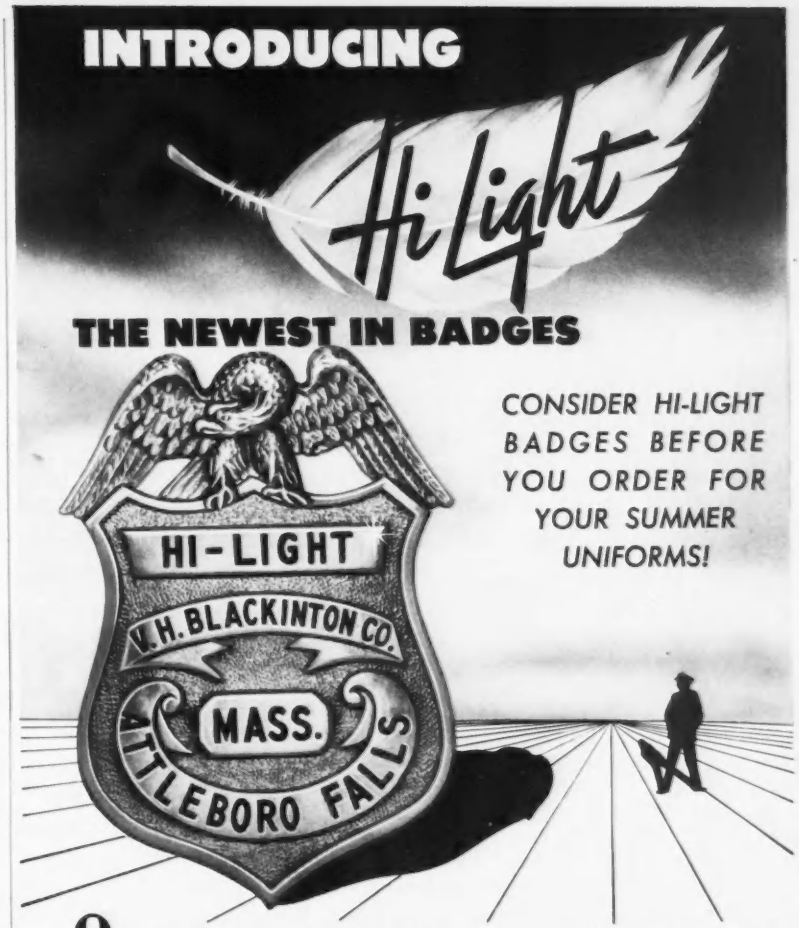
South Dakota: The State Fire School at Mitchell, June 3–7. Chairman Robert Hanigan, Secretary, State Volunteer Firemen's Association, Box 423, Pierre, S. Dak.

Texas: The Fireman's State Training School will be held at the Texas A & M College, College Station. Write to Director Henry D. Smith, Chief Firemen's Training School, Engineering Extension Service, A & M College, College Station, Texas.

Virginia: The Williamsburg Fire Department will be host to the Second Annual Virginia Firemen's School June 24–28. Dormitory and dining facilities of William & Mary College will be made available to the paid, call and volunteer firemen who attend. Cost of the 4-day training course is $20, with instruction to be conducted at the Fire Department's Research and Training Grounds. For information write to Robert B. Smith, Assistant Marshal, Office of the Fire Marshal, Williamsburg, Virginia.

Washington: The Annual State Firemen's School will be held at Spokane, July 11–13. Write to Secretary Emma Ethier, State Firemen's Association, 200 Fifteenth Avenue, Seattle 2, Washington.

West Virginia: The State Fire School will be held at Morgantown, July 22–26. Write to Director R. E. Hanna, Jr., West Virginia University, Morgantown, W. Va.



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Think of it — a badge that's two thirds lighter than your regular badge, in fact it's so light you hardly know you're wearing it. In spite of its feather light weight, your HI-LIGHT metal badge is durable and it's made with the same high quality deep cut precision die work and gleaming finish that has made BLACKINTON badges famous.

Ask your equipment supplier about the many police and fire badge styles that are now available in the new HI-LIGHT metal.

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☐ I would like to know more about the new HI-LIGHT metal badges.

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Attleboro Falls, Massachusetts

The National Fire Museum

This Amoskeag steamer was built in 1898 and saw service in Provincetown, Mass. It is still in good operating condition, capable of pumping 500 gpm. Lieutenant Clark is on rear step as engineer.

SOUTH CARVER, Massachusetts, is the site of a popular tourist attraction called the "Edaville Railroad." Here a miniature train on two-foot gauge rails carries sight-seers through a decorated cranberry bog to view miniature villages, floral and lighting displays and other holiday scenes. Edaville Center also features collections of antique autos and railroad equipment, and the National Fire Museum, Inc. The latter, dedicated to the preservation and restoration of old fire apparatus and equipment, has a number of items of particular interest to fire department members and hobbyists.

At present the Museum houses some thirty pieces of

DEMAND *the new-improved*
ELKHART TRI-LOC NOZZLE HOLDER

In the past year, the fire service has been deluged with an imitation of our obsolete Tri-Loc Holder sold under the name Tri-Loc. Many customers who have received these unknowingly in place of the genuine Elkhart Tri-Loc have had unsatisfactory service.

For the finest and best, specify Elkhart No. 653 (sizes 1½" or 2½") on your next requirement to the following specifications:

- Three moveable lugs—Insures perfect three point contact.
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old-time fire apparatus, including a horse-drawn gasoline pumper named the "Eureka," of Thomaston, Maine, a 1913 Seagrave city service ladder truck that drives and steers by the rear wheels, a Hayes aerial ladder truck, a coffee mill hand tub from Alstead, New Hampshire, that dates back to 1812, and other interesting pieces.

Also on display are fire alarm equipment and a collection of fire helmets from many countries, including Sweden, Thailand, Cambodia, Luxembourg, Yugoslavia, Argentina and Russia.

The Museum collection was started more than twenty years ago when Lawrence N. Clark joined the Newton, Massachusetts, Fire Department. (He is now a lieutenant in the Fire Prevention Office of the Department.) For ten years previous he had been a collector of thousands of pictures of horse-drawn apparatus. After joining the Department, he enlarged his hobby to the building of scale models, particularly for use in fire prevention displays. Then, with the encouragement of Mrs. Clark, he purchased an Amoskeag steamer, and has been expanding the collection of antiques ever since.

On April 6, Edaville Center, the railroad, and the National Fire Museum will open for the Spring and Easter displays. Fire fighters and hobbyists interested in such historical collections can correspond with Lieutenant Clark by writing to 29 Richardson Street, Newton 58, Massachusetts.

Cole Brothers steamer, made in Pawtucket, Rhode Island, and used in Southbridge, Mass., had straight frames, same size wheels front and back, and pumped about 500 gpm. Mrs. Alice Clark, left, greets Museum's visitors.

What Is Fire Protection?

SEVERAL letters received in the NFPA Executive Office recently indicate that there is some difference of opinion in the fire service concerning the definition of the term "fire protection." For the benefit of our readers we include the following statements from the 11th Edition, page 21 of the NFPA Handbook of Fire Protection.

"Fire Protection is used in two senses. The general sense, typified by the use of the term in the National Fire Protection Association name, includes everything relating to the prevention, detection and extinguishment of fire, reduction of losses and other matters covered in the Handbook; it covers both the safeguarding of human life and the preservation of property. In its specific sense, fire protection refers to fire extinguishing and related facilities."

4 FINE FOG FILMS

IN BEAUTIFUL 16 MM. COLOR AND SOUND

PRODUCED BY THE EXPLORATORY COMMITTEE ON THE APPLICATION OF WATER

- **USING WATER WISELY**
  A 23-minute film covering fire fighting methods on small fires using hand line spray nozzles on booster and 1½" hose in most cases.
- **MASTER SPRAY STREAM PROBLEMS**
  A 20-minute film on large volume spray nozzle control of major fires to reduce temperature, showing large spray nozzles on heavy stream units, deluge sets, and deck guns.
- **FOG AGAINST FIRE**
  A 20-minute showing of fog on rural dwellings from portable water supply, 1½" lines on suburban dwellings, used by departments on mutual aid basis.
- **LET'S TRY FOG**
  A spectacular 18-minute film on oil pit, tank truck, oil storage tank, rubber tire, and small ammunition fires, using wetting agents, foam, and plain water.

"SALVAGE"

A 10-minute film validated by the International Fire Service Training Assn., with 83 colored 35 mm. slides as a supplement.

STEVE SMITH PICTURES

ROUTE 6 **TOPEKA, KS.**

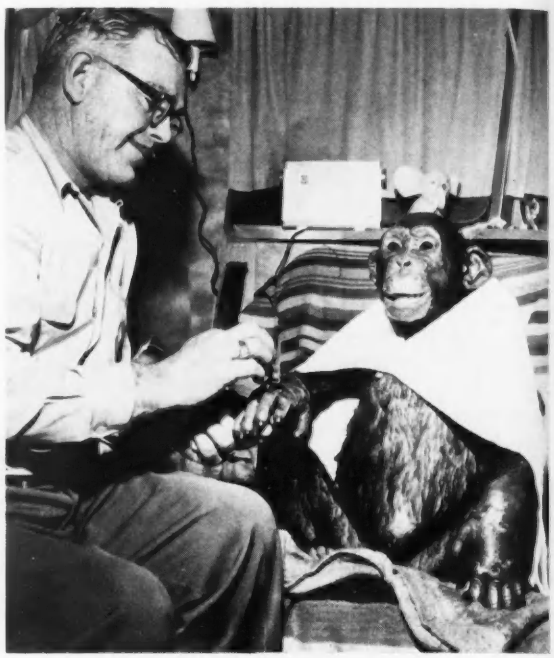
Write For Your Descriptive Folder Today

The Chimp Was a Simp!

CHIEF Charles L. Burkett of the Salisbury, North Carolina, Fire Department reports a sad incident concerning the singed chimpanzee shown at right. Seems that the Miller Brothers Circus visited Salisbury recently with the chimp housed in a cage in one of the wagons. At one end of the wagon was a small heating unit burning propane gas. Some time during the night an attendant left a bottle of the gas outside the cage. Mr. Chimp reached through the bars, opened the valve on the bottle, allowing gas to escape and ignite. Soon he was licking his burns while Salisbury fire fighters were handling the resultant fire.

It is reported that after the excitement was over and his burns had been treated, Mr. Chimp was given a thorough lecture on fire prevention, particularly on the fact that the NFPA has a number of standards with recommended practices for safe handling of liquefied petroleum gas. His reaction was characteristic.

"Well, I'll be a monkey's uncle!" he said.



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—through the din at a fire

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750 Gallon Darley Pumper

The pump is the Darley Champion Type SH750 manufactured exclusively by W. S. Darley & Co. and used on all Champion Fire Apparatus. A 3-stage centrifugal with superior engineering features which guarantee brilliant performance throughout the entire range of pumping requirements for fire fighting.

The SH Series Champions are double duty fire pumps which provide the complete range of volume performance for heavy streams plus the fire smashing efficiency of high pressure fog with 60 gallons per minute at 850 lbs. of pressure at the pump. Actual tests show the SH pump develops pressure to 1 000 lbs.

Write for Fire Equipment Catalog and Fire Apparatus Booklet
AT YOUR SERVICE: Sales and Service Representatives — East, Midwest, North, South

You'll want to know all about our low cost finance plan or combination PURCHASE-RENTAL plan.

W. S. DARLEY & CO., Chicago 12
Factories — Chicago and Chippewa Falls, Wis.

Memphis Salvage Truck

SHOWN above is a Memphis, Tennessee, fire department salvage truck demonstrated during the 1957 Fire Department Instructors' Conference (see page 14). It has a new hydraulic turret nozzle built by McIntire Brass Company of Cambridge, Massachusetts.

This nozzle, fed by ten 3-in. gated inlets, is controlled by an oil hydraulic system that gives virtual fingertip control while the nozzle is discharging approximately 2700 gpm at 100 pounds nozzle pressure, or providing a large capacity fog. Another interesting feature of the truck is the permanently mounted 1-in. fog nozzles which are used to protect the truck and operator from intense heat and smoke when the truck is operating close to major fires.

As previously reported in FIREMEN magazine, it is the practice of the Memphis Department on occasion to drive such apparatus into a large area building to drive back a fire and provide an effective barrage for the advancement of hand lines. In one of the demonstrations the apparatus was supplied by two 1500 gpm pumpers and discharged well over 2800 gpm. In high hazard and industrial areas the Memphis assignment card calls for dispatch of large capacity pumpers for special water supply service, in addition to the engine companies normally assigned to the alarm for general fire duty.

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AND BE SURE

Yes, you must protect your own life in order to successfully save another . . . and the surest way of doing that is to don a Scott Air-Pak before you enter a smoke filled area. Then you will breathe pure, fresh, cool air no matter how thick or poisonous the smoke.

The New SCOTTORAMIC Mask gives unlimited vision in all directions, making a rescue job with a Scott Air-Pak safer and surer.

Is your fire company Scott equipped for modern rescue work? Let us show you how little it costs. You'll be amazed at the annual savings over other types of breathing equipment. Write us today or contact your nearest Scott Distributor.

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Reduces Accidents — Saves Lives!

When working under hazardous conditions in smoke, fog, dust and darkness, you deserve the safety protection found only in the Midwestern Striped Safety Coat. The highly visible yellow stripes are *rubberized as part of the material* . . . not glued, painted or sewed on.

There are many imitations but no substitute for Midwestern quality, design, fabric texture and safety features. For complete information see your Midwestern dealer. A letter to the factory will also bring you literature and materials for your inspection.

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REGULATION and DROP BRIM STYLES

FIRE HELMETS SINCE 1836

"THERE IS NO SUBSTITUTE FOR EXPERIENCE"

Write for Catalog 350

CAIRNS & BRO., INC. — Allwood, Clifton, N. J.

Membership Report

FIRE departments from 32 of the United States, the Territory of Alaska, and three Canadian Provinces are included in the list of new NFPA member departments shown below. Actually, this is a two-month accumulation of names since it was not possible to publish a list in last month's issue.

Currently, NFPA Fire Department membership has reached its highest all-time total, with 2,347 fire departments and 27,577 fire fighters now receiving FIREMEN and other benefits of Association membership. In addition, more than 3,000 individuals in industry subscribe to FIREMEN magazine.

For the benefit of readers who may have missed earlier announcements, here is the new distribution plan for the magazine: Any paid, call or volunteer municipal fire department that takes NFPA membership is entitled to receive four (4) subscriptions to FIREMEN at no extra charge, plus single subscriptions to the NFPA *Quarterly* and the monthly *Fire News*. Additional subscriptions to FIREMEN may be ordered for only $2.00 each. Industrial and governmental fire brigades and all other NFPA members pay $2.00 for each subscription.

NFPA Welcomes:

The following fire departments as members of the Association:

Alabama: Lanett Fire Department, Lanett; Montevallo Fire Department, Montevallo; Trussville Volunteer Fire Department, Trussville.

Alaska: Juneau Volunteer Fire Department, Juneau.

Arizona: Metropolitan Fire Department, Phoenix; Whiteriver Volunteer Fire Department, Whiteriver.

Arkansas: England Fire Department, England.

British Columbia: Gordon River Volunteer Fire Department, Honeymoon Bay.

California: Salinas Fire Department, Salinas; Susanville Volunteer Fire Department, Susanville.

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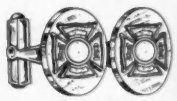
FD NEW CAR EMBLEM. 4" cast aluminum. Fits all cars. $1.98.



FD CUFF LINKS — gold finish — lacquered — pair $2.50.

FD TIE CLIP — gold finish — lacquered — $1.98.

FD LAPEL BUTTON — gold finish — lacquered — $1.50.

Also available car emblems for Aux Fire Dept., Civ. Defense, Civ. Air Patrol, all fraternal, professional and civic groups — same price. Money - back guarantee.

STA-DRI CO., 6th Avenue Dept. F-4, Whitestone, N. Y.

Connecticut: Andover Volunteer Fire Department, Inc., Andover, Chief Albert O. Bonesio, Avon Volunteer Fire Department, Inc., Avon; West Avon Volunteer Fire Department, Avon; East Farmington Volunteer Fire Department, Inc., Elmwood; Manchester Fire Department (8th District), Manchester; Riverside Fire Company, Inc., Oxford; Plainville Fire Company, Inc., Plainville; Chief Richard P. Jones, South Windsor Volunteer Fire Department, South Windsor; Westbrook Fire Department, Westbrook.

Georgia: Gainesville Fire Department, Gainesville; Loganville Fire Department, Loganville.

Illinois: Barrington Fire Department, Inc., Barrington; Dixon Rural Fire Department, Dixon; North West Homer Volunteer Fire Department, Lockport; Richwood Twp. Fire Protection District, Peoria; Roanoke Volunteer Fire Department, Inc., Roanoke; Roxana Fire Department, Roxana; Wheeling Volunteer Fire Department, Wheeling.

Indiana: Jeffersonville Fire Department, Jeffersonville; Chief John J. Kostolnik, Whiting Fire Department, Whiting.

Kansas: Pratt Fire Department, Pratt.

Kentucky: Silver Grove Volunteer Fire Department, Inc., Silver Grove.

Louisiana: Bogalusa Fire Department, Bogalusa; Jefferson Fire Department No. 1, Jefferson Parish; Third District Volunteer Fire Department, Little Farms, Jefferson Parish; Kenner Volunteer Fire Department, Kenner; St. Tammany Fire Protection District No. 1, Slidell.

Maine: Boothbay Harbor Fire Department, Boothbay Harbor; Vassalboro Fire Department, North Vassalboro; Saco Fire Department, Saco; Highpine Fire Association, Inc., Wells.

Massachusetts: Acton Fire Department, Acton; Amherst Fire Department, Amherst; Chesterfield Volunteer Fire Department, Chesterfield; Maynard Fire Department, Maynard; Egremont Fire Department, North Egremont; Sharon Fire Department, Sharon.

Michigan: Cheboygan Fire Department, Cheboygan; Croswell Fire Department, Croswell; Chief Norm Crittenden, Galesburg Fire Department, Galesburg; Hadley Twp. Fire Department, Hadley; Hastings City Fire Department, Hastings; Highland Twp. Fire Department, Highland; North Leoni Fire Department, Jackson; Summit Twp. Fire Department, Jackson; Muskegon Fire Department, Muskegon; Omer City Fire Department, Omer; Huron Twp Fire Department No. 3, Romulus; Ypsilanti Fire Department, Ypsilanti.

Minnesota: Grand Lake Volunteer Fire Department, Twig.

Missouri: Prairie Twp. Fire Protection District, Greenwood.

Montana: Home-Atherton Volunteer Fire Department, Butte.

Nebraska: Hebron Volunteer Fire Department, Hebron; Humphrey Fire Department, Humphrey.

New Hampshire: New Ipswich Fire Department, New Ipswich; Weare Volunteer Fire Company, North Weare.

New Jersey: U. S. Army, Picatinny Arsenal, Dover; Magnolia Fire Company, Magnolia.

New York: Cattaraugus Fire Company, Inc., Cattaraugus; Freeport Fire Department, Freeport; Brighton Volunteer Fire Company No. 5, Inc., Tonawanda.

North Dakota: Drake Volunteer Fire Department, Drake.

Nova Scotia: Cheticamp Fire Brigade, Cheticamp; LaHave Fire Department, LaHave.

Oklahoma: Dewey Fire Department, Dewey.

Ontario: Porcupine Fire Department, Porcupine.

Oregon: Row River Volunteer Fire Department, Dorena.

Pennsylvania: West Whiteland Fire Company, Exton; Hawley Fire Company No. 1, Hawley; Shamokin City Fire Department, Shamokin; Stroud Twp. Volunteer Fire Department, Stroudsburg.

South Carolina: Loris Fire Department, Loris; St. Andrews Fire Department, St. Andrews Parish, Charleston.

Tennessee: Lexington Volunteer Fire Department, Lexington.

Virginia: Chase City Volunteer Fire Department, Chase City; Gate City Volunteer Fire Department, Gate City; Marion Volunteer Fire Department, Marion.

Washington: Chehalis Fire Department, Chehalis; Asotin Company FPD No. 1, Clarkston.

West Virginia: Gauley Bridge Volunteer Fire Company, Inc., Gauley Bridge.

Wisconsin: Beloit Fire Department, Beloit.

Wyoming: Buffalo Volunteer Fire Department, Buffalo; Cheyenne Fire Department, Cheyenne.

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LOOK ALIKE
BUT THERE'S
ONE
IMPORTANT
difference*

You can buy drills in the dime store . . . or pay thousands of dollars for a diamond drill.

They *look* alike . . . but the difference is in the job you want your drill to do.

Fire hose spends most of its life hanging on racks but you certainly don't buy it because it looks good hanging there . . . or *do* you?

You can't get Bi-Lateral Fire Hose in the dime store — for bargain prices. But Bi-Lateral is still your best bargain for the job you want to do — that's the important difference in fire hose!

THE *SAFEST* INVESTMENT IS BI-LATERAL FIRE HOSE... IT COSTS *LESS* TO BUY THE BEST!

If you want safety AND savings, one way to be sure is to look at the record!

Bi-Lateral furnishes *FREE* hose record cards — send for your supply today.

Here's a sample piece of fire hose — it looks just like the piece below — yet . . .

This fire hose is worth 10 times — maybe 1,000 times — as much!

Bi-Lateral hose is built *up* to a standard not *down* to a price! There's a reason for Bi-Lateral — it's to put out fires! It will prove to be your most *economical* purchase as well as your *safest* investment!

(Bi-Lateral *IS* cheaper *in the long run*. Hose record cards prove it! Send for yours . . . free.)

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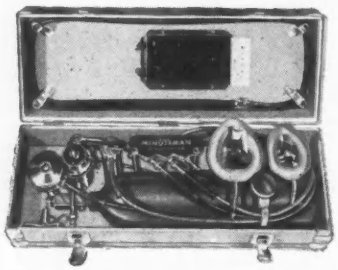
20 NORTH WACKER DRIVE • CHICAGO 6, ILLINOIS

ACTION . . . . Fast . . . . Efficient

STEPHENSON "MINUTEMAN" RESUSCITATOR

Weighs only 30 pounds.



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INHALATOR RESUSCITATOR ASPIRATOR

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The accelerated tempo of modern times demands modern techniques plus stepped-up efficiency. Fire departments everywhere find the Super Vacuum Smoke Ejector provides the extra margin of efficiency necessary in modern day fire fighting. New and revolutionary in design, Super Vacuum will outperform other fans twice its size...gives the positive, controlled ventilation essential to the prompt, efficient control of fires.
CONTROL VENTILATION
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The heart of the SUPER VACUUM Smoke Ejector is the patented propeller. Conventional fans produce a chopping, recirculating action. In contrast, the SUPER VACUUM propeller is a perfect spiral air screw which creates a vacuum...suction is created over the entire face of the propeller and the air or smoke is discharged in a high velocity spiral. There are no dead spots.
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MAKING A GOOD JOB OF IT

BY WARREN Y. KIMBALL

What Gives at the Clapper?

NOT infrequently the question arises about what happens inside a siamese connection at the clapper valves when two or more lines are coming in from different sources with different pressures. It has been reasoned by some that the higher pressure in one line should close the clapper in the lower pressure line.

In practice, the only way this can happen is for the flow pressure at the clapper from the higher pressure line to exceed the static or source pressure on the lower pressure line. This can seldom occur if the proper size nozzle tip is being used, unless there is great disparity between the two sources of supply.

Let us assume, for example, that one line is delivering 60 lbs. at the siamese and that the other line is delivering 90 lbs. at the siamese. Will the 90-lb. line close the clapper against the 60-lb. line? It can do so only if the 90 lbs. exceeds the pump or hydrant pressure supplying the 60 lbs. at the siamese and if the 90 lbs. is able to maintain the stream alone without the added volume of the lower pressure line.

Now to be more specific, suppose that the siamese is supplying a 1½-in. tip at over 500 gpm with lines from two sources of supply. Let us assume that the higher pressure on one supply line could close the clapper on the other. What would happen?

Once the clapper was closed the full static pressure would be exerted against the closed clapper because there would be no friction loss in the line that was not flowing. Unless the higher pressure line could maintain superior force against the opposing static source, it could not keep the clapper closed. What are the chances of this? When the clap-

(*Continued on page 32*)

NEW DURA-FOG NOZZLE by POWHATAN

NAMED FOR ITS DURABILITY

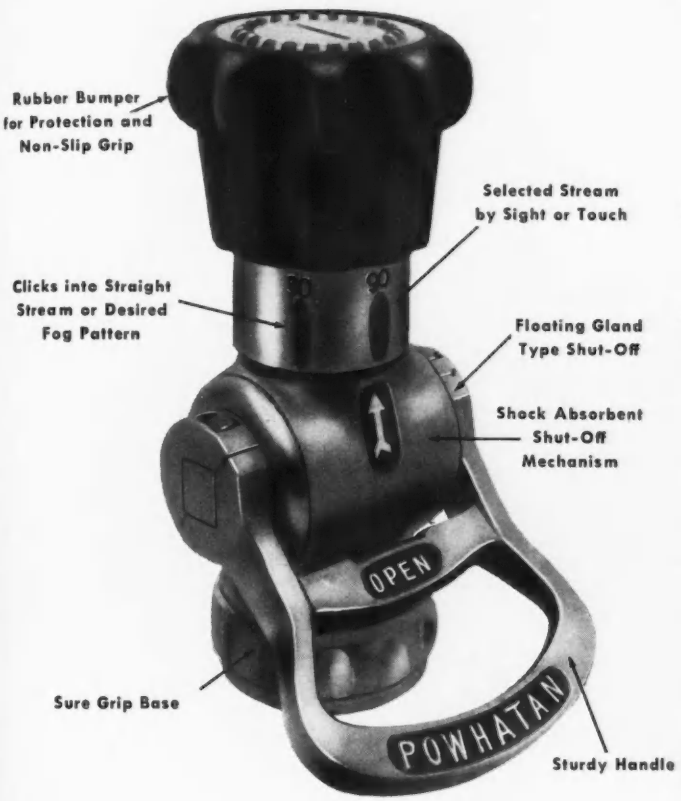
Rubber Bumper for Protection and Non-Slip Grip
Selected Stream by Sight or Touch
Clicks into Straight Stream or Desired Fog Pattern
Floating Gland Type Shut-Off
Shock Absorbent Shut-Off Mechanism
OPEN
POWHATAN
Sure Grip Base
Sturdy Handle

PLATE No. 261

NO LEAK in over a million shut-offs . . . test proof of durability!

100% PERFORMANCE TEST for every Dura-Fog Nozzle!

Performance Test Data for 1½" Size

Water Pattern	GPM	Reach	Nozzle Pressure
STRAIGHT STREAM	57 62	85′ 105′	100 psi 125 psi
30° FOG PATTERN	60 65	40′ 43′	100 psi 125 psi
60° FOG PATTERN	65 68	30′ 35′	100 psi 125 psi
90° FOG PATTERN	72 75	20′ 22′	100 psi 125 psi

Contact your local distributor today, write POWHATAN direct for all the facts on the new Dura-Fog Nozzle. . . . Ask for our free Catalog "A".

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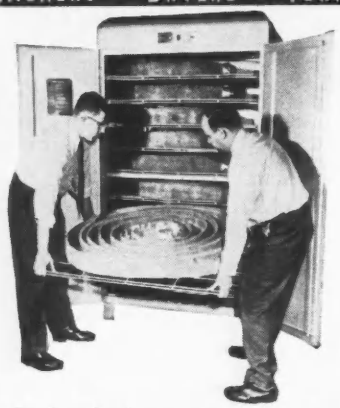
Better Hose Care-with CIRCUL-AIR
HOSE CONDITIONING EQUIPMENT
WASHERS • DRYERS • TURN-TABLES • STORAGE RACKS



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PERMANENT MOUNTED
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Eastman Model 20 Deluge Gun is designed for permanent installation on fire apparatus, fire boats, oil refineries, lumber yards, or any outside plant installations requiring quick effective fire protection. When a large volume of water is to be delivered in solid, far-reaching streams — SPECIFY EASTMAN MODEL 20.

SAMUEL EASTMAN CO., INC.
CONCORD, NEW HAMPSHIRE

Making a Good Job of It

(Continued from page 30)

per was closed, the single higher pressure line would have to supply the entire flow for the nozzle with a marked increase in friction loss in this remaining line. With 500 gpm flowing, the friction loss would be 55 lbs. per 100 ft. Even if the nozzle pressure should fall to half the previous figure the flow would remain in the order of 400 gpm and the friction loss would be very high in the line which formerly had the higher pressure. This line would then be delivering less pressure to the siamese than static pressure exerted against the closed clapper by the other line, so the clapper would open.

The most serious situation is where the clapper alternately closes and opens, an occurrence which is determined readily by the behavior of the hose and the erratic nature of the stream. This has been observed, for example, where a 150-lb. pumper line was siamesed with a 50-lb. hydrant line. If such erratic results are noticed, the pressure on the weaker line should be increased if possible. A smaller nozzle tip may be used to reduce the demand. It has long been recognized that for best results all lines to a siamese device should be from the same source or at least enter the device at the same pressure to provide smooth flow and avoid needless turbulence.

The question may also arise as to what the results may be when lines of different diameter are siamesed together as when both 2½-in. and 3-in. hose supply a siamese. Again, if both lines are from the same source we have no problem, but if they are from two sources the larger hose will deliver more energy to the siamese than the smaller hose, other things being equal. Let us take the case of a 3-in. hydrant line supplying a pumper with 50 lbs. flowing pressure at the hydrant. Later a 2½-in. pumper line is connected to the first pumper's supply with 150 lbs. source pressure. Will the pumper back-up line shut off the clapper to the 3-in. hydrant line?

It will do so only if the supply line under pump pressure can supply all the water that is being used with a pressure at the siamese clapper greater than the static pressure at the hydrant feeding the 3-in. line.

Get Set to Spring into Action with INDIAN FIRE PUMPS

If you've been under the impression that INDIAN FIRE PUMPS were intended for use only on brush and grass fires you're in for a big surprise. Just read this letter from a user who once thought the same thing:

"I once thought INDIAN FIRE PUMPS had use only where a volunteer department was putting out grass fires. Since including a No. 90 galvanized INDIAN on our apparatus, however, I found that the men would not use any other type of extinguisher.

That led me to buy a number of No. 90 solid brass tank INDIAN FIRE PUMPS and place them on all our equipment. We are most enthusiastic about INDIANS and prefer them to any other hand extinguisher for all class A and small oil fires."

George P. Lasher, Fire Chief

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NO. 90 INDIAN
SLIDING PUMP TYPE

All seams electric welded
No leakage

Both Types Approved by Underwriters' Laboratories, Inc.

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PUMP and HANDLE

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"For 70 Years the Leaders"

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CANADIAN AGENTS

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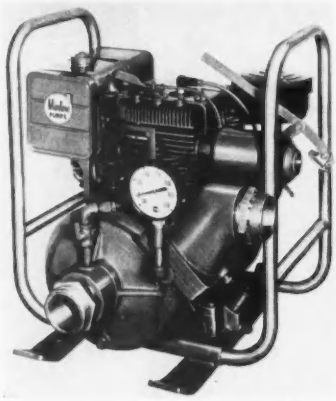
News Items and New Equipment of Interest to the Fire Service



New Portable Pump

Marlow Pumps, Division of Bell & Gossett Company, Midland Park, New Jersey, is producing this new lightweight portable pump for fire fighting. Weighing only 160 pounds with gas and oil, ready to operate, the pump is powered by a 9 H.P. 4-cycle Briggs & Stratton engine and is mounted on a structural steel skid type base. It has a compound gage, an automatic check valve and removable handles. According to the manufacturer it will pump 100 gpm at 80 pounds and 60 gpm at 100 pounds. Write to the manufacturer for additional information.

Hydraulic Expander

Bell-Pihl Company, 17 Wyman Street, Arlington 74, Massachusetts, is manufacturing a hand-operated hydraulic expander for fitting brass expansion rings to fire hose. All models of the expander are equipped with a hydraulic pressure gage. The expander is designed for attaching brass expansion rings of ¾, 1, 1¼, 1½, 2, 2½ and 3 in. sizes. Write to the manufacturer at the above address for complete information.

A new hydrant ratchet wrench with 4-inch swing for quick and easy openings is now available. Write to *S-T Hydrant Wrench Company*, Box 921-M, Holyoke, Mass. . . . F. Norman Tracy has been elected president of *Ward LaFrance Truck Corporation*. . . . *Steve Smith Pictures*, Route 6, Topeka, Kansas, is distributing four popular films sponsored by the Exploratory Committee on Application of Water. Illustrated folder free.

New Model 41 portable electric generators of 3,000 watts are now available from *Homelite*, Port Chester, N. Y. . . . To keep pace with increased sales of Scott Air-Pak and other breathing equipment, *Scott Aviation Corp.* has moved into a new and larger office building adjoining the plant in Lancaster, N. Y. . . . *Parish Pressed Steel*, division of Dana Corporation, Reading, Pa., is marketing a new mobile Industry Emergency Unit fully equipped for fire, plant disaster and Civil Defense programs. Write for details.

Fire regulation enforcement officials should know about the Safety Storage Cabinet for flammable liquids, designed to meet NFPA Standard No. 30 and manufactured by *Protectoseal Company*, 1968 S. Western Ave., Chicago 8, Ill. A useful free guide to Protectoseal "approved" equipment is available from the Company . . . The "Little Bean" high pressure fog Fire Fighter may be the answer to your need for a smaller, highly maneuverable unit. Write to *John Bean Division*, Food Machinery & Chemical Corp., Lansing, Mich. . . . You can get the facts on "Flexalarm" fire alarm systems by asking for Catalog F 249 from *Gamewell Company*, Newton Upper Falls 64, Mass.

Built-in protection of 100 percent "Dacron" polyester fibre strips over the outer jacket is reported to give longer life to Super Fyr-Strype municipal fire hose by *Fyr-Fyter Company*, 221 Crane St., Dayton, Ohio. . . .

Porto-RAK

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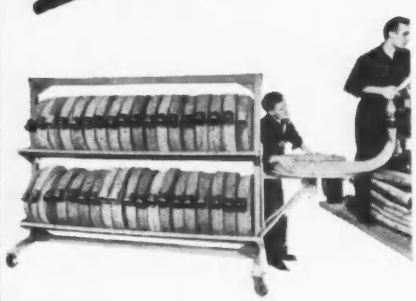

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KEEPS HOSE AND COUPLINGS OFF THE FLOOR
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PORTO-RAK holds 1800 feet of 2½" hose and proportionally more of 1½" hose in an 8½' space (loading table detached). Easy, convenient to use. Roll it right up to the truck for complete hose reload — out of the way when not in use. Equipped with locking fiber-wheeled casters. **Why lug hose? Let PORTO-RAK do the work!**

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